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MEMORANDUM
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To: Mark Consilvio, Examiner, Art Unit 2872

From: Daryl W. Schnurr
519.593.3226

Date: August 31, 2006

Subject: Application:10/648,450 Dixon et al
Our File: 58305.0007

DISCUSSION POINTS FOR TELEPHONE INTERVIEW AUGUST 31, 2006, 2:00PM

On page 4 of the Office Action, the Examiner states that Engelhardt, US Patent 6,909,540 teaches in Column 5, lines 5-8 and Figures 1-3 that for a confocal scanning microscope, an objective lens is movable relative to an object to achieve coarse focusing and a focus lens in moved relative to a scan lens for fine focusing. Engelhardt does not disclose a scan lens and in lines 5-8 of Column 5 of Engelhardt, it is stated that the entire objective or the entire turret is displaceable in known fashion for coarse focusing and in this variance the lens elements displaceable within the objective housing are used for fine focusing. In other words, Engelhardt is suggesting moving the entire objective or moving lenses within the objective. Engelhardt teaches placing all of the elements of a microscope objective in a barrel. If the same technique was used for a macroscope, all of the elements of the scan lens would be placed in a cylinder and moved. It is not reasonably feasible to move the scan lenses of the present invention as they are so large and contain multiple elements.

If a subset of elements (or even one element) is moved relative to the other elements of the objective as suggested by Engelhardt, the focal length of the objective and thus the magnification If a subset of elements (or even only one element) is moved relative to the other elements, this will change the focal length of the objective, and thus the magnification of the microscope will be changed. In an x-z scan, this would result in the magnification at the top of the image being different from that at the bottom. For confocal slices, the magnification would change from slice to slice. If this motion were to be used during rapid focus during a scan, the magnification would

change during the scan. A diagram of one of the scan lenses of the applicant is attached. The elements are all in contact with one another so that it is not possible to move any of the elements relative to the others except for the bottom element. Moving the bottom element relative to the others would change the focal length of the lens, which would make the macroscope unworkable. When other elements within the objective are moved relative to element 13 as suggested by Engelhardt, the focus position of the microscope as well as the focal length will change. The spacing of the elements of an objective are a critical component of the design of the microscope. Engelhardt also teaches that every microscope objective mounted in the turret would incorporate the features of all or a subset of elements to be moved. This would greatly increase the complexity and cost of the microscope as a whole. The focusing lenses described in Dixon are ordinary lenses. They are not scan lenses with external entrance pupils and the focusing lenses described in Dixon cannot be used to focus the macroscope. Dixon does disclose a scan lens with external entrance pupil in Figures 4A and B.

The present invention shows that only one lens in the intermediate optics, not in the scan lens, must be moved to change focus and there is no change in magnification with a focus change. Further, scan lenses can be interchanged without requiring each lens to be modified for fine focus as would be required in the arrangement suggested by Engelhardt. It has not been suggested previously to use a lens in the intermediate optics to change the focus of a scan lens. The focus in Dixon is the focusing stage 208 that moves specimen 130 relative to the scan lens 400.